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(54) HOLLOW TOY BUILDING BLOCK

(71) We, DART INDUSTRIES INC., a Corporation organised and existing under the Laws of the State of Delaware, United States of America, of 8480 Beverly Boulevard, Los Angeles, State of California 90054, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to toy building blocks and relates more particularly to a toy building block which can be opened and interconnected with other similar toy building blocks.

It has been speculated that toy building blocks have been used by children since before recorded history. Egyptian children likely used small blocks of stone to build small structures in an attempt to imitate the adults who were using larger blocks to construct huge stone structures.

It is known that building blocks were used during the Victorian Era for teaching religious history. The blocks were provided with portions of a picture which co-operated with other blocks having other portions of the picture so that the blocks could be assembled to display an entire religious scene.

In the 19th century, hollow building blocks were used which had recesses or cavities covered with a transparent material such as glass and which contained ornaments, pictures, or other objects which could be seen through the glass.

According to the present invention there is provided a prismic toy building block having at least one base and a plurality of connecting lateral side walls with lateral edges formed where said lateral side walls intersect, which building block is sectioned along a plane passing through at least two opposing lateral side walls to thereby form two secondary prismic sections each of which sections has a planar area formed by said plane, said secondary prismic sections being hinged together where said plane intersects one of said opposed lateral side walls so that said toy building block may be opened by separating said secondary prismic sections along said sectioning plane by pivoting one of said secondary prismic sections about said hinge with respect to the other of said secondary prismic sections, means being provided for releasably securing each of said secondary prismic sections along said planar area to a secondary section of a similar toy building block along the planar area of one of its secondary prismic sections such that a chain of such blocks may be built up in which each of said blocks, other than the end blocks in the chain, is secured to two adjacent blocks, said securing means also being capable of releasably holding said secondary prismic sections of said block together along said planar areas when said sections are not separated.

It will be appreciated that the present block is provided with a connecting structure which permits interconnection with similar open blocks along the planar area on each prismic section formed by the plane which sections the block. The connection along the planar area with another prismic section from another block can form a structure having a shape substantially the same as the original block and can form a structure which can be stacked with other unconected blocks or with other connected blocks. In addition, the connection along the planar area can form symmetrical shapes and the openings into the block along the planar area, if it is hollow, can be closed by the interconnection of blocks.

The block likewise provides a constructional toy for interconnecting building

[*Price 33p*]

blocks to form structures. The block, which may permit the formation of either symmetrical or asymmetrical shapes, which may be hollow, yet be closed by interconnection with other blocks and which can be used as regular unconnected building blocks, without external connecting structures is interesting, educational and amusing and therefore meets the requirements of an excellent toy.

Preferably said securing means comprises a plurality of lugs on one of said secondary prismic sections and recesses for accepting said lugs on the other of said secondary prismic sections.

It is also preferred that the plane sectioning the block passes through at least two opposed lateral edges, which edges are each edges of one of said at least two opposed lateral side walls.

Preferably said securing means comprises a plurality of lugs positioned both proximate said hinge and proximate the lateral edge opposing said hinge on one of said secondary prismic sections, and matching recesses on the other of said secondary prismic sections so that said lugs will snap into said recesses to securely and releasably hold said secondary prismic sections together along said planar areas when said sections are not separated and when said sections are separated to securely and releasably hold either or both of said sections to a separated secondary prismic section of a similar toy building block.

It is preferred that said block is hollow.

It is further preferred that said planar areas are open areas so that access to the hollow portion of each of said secondary prismic sections may be achieved through said planar areas.

It is also preferred that said block is manufactured of a resilient shape-retaining plastics material.

Preferably said block is cubic and each of said secondary prismic sections has an equal right triangular cross-section.

It is also preferred that each block has two bases and these bases may have ribs exteriorly exposed thereon.

The invention also includes a set of toy building blocks in accordance with the invention, wherein the secondary prismic sections of each of said blocks have been separated and said blocks are interconnected by said securing means.

A specific embodiment of the invention will now be described with reference to the accompanying drawings in which:—

Figure 1 is a top perspective view of a toy building block,

Figure 2 is a top perspective view of the toy building block, in its opened condition,

Figure 3 is a front perspective view showing two of the toy building blocks assembled to a secondary prismic section of the other block,

Figure 4 is a front plan view showing four of the blocks assembled together to form a hexahedron,

Figure 5 is a top perspective view of the block shown in Figure 1 rotated 90 degrees to the right,

Figure 6 is a top perspective view of the block shown in Figure 5 with one corner broken away,

Figure 7 is a sectional view showing the block connection taken along lines 7-7 of Figure 3,

Figure 8 is a front perspective view of the toy building block shown in a partially opened position, and

Figure 9 is a top plan view of the block shown in Figure 2.

Figure 1 shows a polyhedral prismic block of the preferred embodiment. The particular block shown in Figure 1 is a prismic hexahedral block 10 of cubical shape, although the particular polyhedral prism could be of any other shape such as a right triangular prism. The prismic block is defined by two major bases 34 and 35 connected by lateral walls 17, 18, 19 and 20. The intersection of the lateral walls defines lateral edges 29, 30, 31 and 32. In the preferred embodiment, block 10 is sectioned along a plane between two opposing lateral edges to form prismic sections 11 and 12. Prismic section 11 is defined by secondary bases 13 and 14, lateral walls 17 and 18 and lateral area 36. Prismic section 12 is defined by secondary bases 15 and 16, lateral walls 19 and 20 and lateral area 37. The intersection of lateral area 36 with lateral walls 17 and 18 forms lateral edges 29*a* and 31*a* respectively and the intersection of lateral area 37 with lateral walls 19 and 20 forms lateral edges 29*b* and 31*b* respectively.

Lateral edges 31*a* and 31*b* are connected by a hinge 33 so that the secondary prismic sections 11 and 12 may be separated by pivoting one of the secondary sections about the hinge in relation to the other secondary prismic section. Of course the lateral areas 36 and 37 are representative in essence of the sectioning plane spoken of.

In the preferred embodiment, each of the secondary prismic sections has means for securing the secondary sections together along the sectioning plane when the sections are not separated, and for securing each of the secondary sections to a separated secondary prismic section of a similar toy building block. As best seen in Figures 2 and 9, the securing means of the preferred embodiment comprises a first pair of separated integral lugs 21 and 22 that form a part of a flange 38 that protrudes

from lateral area 37 on secondary base 15 of secondary section 12. Similarly, another pair of separated lugs 23 and 24 extend from a flange 39 on secondary base 16 and these lugs 21 to 24 engage matching recesses 25, 26, 27 and 28 on secondary section 11 when said sections are closed one upon the other as is shown in Figures 1, 5 and 6.

Likewise, as is best seen in Figures 3 and 4, either the lugs or the recesses may engage matching recesses or lugs respectively of a secondary prismic section of a similar toy building block to form a combined block shape similar to that of original block 10. Thus, by variously interengaging the secondary prismic sections of the blocks, new block arrangements may be created. The combined hexhedrons of Figure 4 is an example but interlocking chains and other structures are also easily produced.

Figure 6 shows a block of the preferred embodiment having a corner broken away to show the engagement of lugs 21 and 24 with recesses 25 and 28 respectively. Figure 7 shows an enlarged view of the engagement of a lug (for example 24) from a secondary prismic section of a similar block with recess 25. The locking feature having at least two lugs engaging at least two recesses to form a major base 34 or 35 forms a secure attachment which will not easily wobble after the lugs are snapped into the recesses.

It should also be apparent from the various Figures that the major bases 34 and 35 and corresponding secondary bases 13, 14, 15 and 16 included exteriorly exposed ribs 40 between which are located land areas 41 (Figure 8). The ribs 40 are ideally disposed on a bias with respect to the surface configuration and are of varying heights (each decreasing from that which is thickest—the centre-most rib). This will accommodate for any material shrinkage in the event that the blocks are moulded from plastics materials, and will thus ensure the creation of substantially flat surface areas which are critical for good stacking characteristics. Similarly, rib width is substantially more than land width so that nesting is prevented. This also is dictated to produce satisfactory stacking features.

Another significant feature of the invention is the unobtrusive hinge 33, which is no more than a fine of material connecting lateral edges 31*a* and 31*b* and in effect is lateral edge 31. Unexpectedly no excess of material is needed to produce the hinge and therefore each lateral edge is similar to each other such edge. This is also significant not only to the esthetics of the blocks, but also to the functional interrelationships therebetween.

The block may be manufactured of any suitable material and is preferably manufactured from a resilient, shape-retaining, plastics material to assist in forming a securing means for holding one secondary prismic section to another which securing means can be easily engaged and disengaged.

In carrying into effect this invention, any prismic toy building block may be used which is defined by at least one base and a plurality of connecting sidewalls and is sectioned a long a plane passing through at least two opposing sidewalls. Two secondary prismic sections will be formed by the sectioning plane and these sections are hinged together along one of the lines defined by the intersection of the sectioning plane with the base or one of the side walls so that the toy building block may be opened by pivoting the secondary sections relative to one another about the noted hinge. The block may likewise be similarly sectioned by more than one plane and the resulting sections may be attached to each other by more than one hinge.

In accordance with this invention, each of the secondary prismic sections is provided with a connecting means that selectively retains the secondary polyhedral sections in a closed position and which is adapted to interconnect with similar mating sections of like prismic toy building blocks when each have been opened.

While a toy building block having any prismic shape can be made having the majority of the advantages taught by this invention a hexahedral shape is preferred due to the regular stacking and connecting features which result.

The sectioning plane may pass through a line formed by the intersection of a pair of the side walls of the hexahedron or, in other words, a lateral edge, thus a parting line between the prismic secondary prismic sections is hidden by the lateral edge.

WHAT WE CLAIM IS:—

1. A prismic toy building block having at least one base and a plurality of connecting lateral side walls with lateral edges formed where said lateral side walls intersect, which building block is sectioned along a plane passing through at least two opposing lateral side walls to thereby form two secondary prismic sections each of which sections has a planar area formed by said plane, said secondary prismic sections being hinged together where said plane intersects one of said opposed lateral side walls so that said toy building block may be opened by separating said secondary prismic sections along said sectioning plane by pivoting one of said secondary prismic sections about said hinge with respect to the other of said

from lateral area 37 on secondary base 15 of secondary section 12. Similarly, another pair of separated lugs 23 and 24 extend from a flange 39 on secondary base 16 and these lugs 21 to 24 engage matching recesses 25, 26, 27 and 28 on secondary section 11 when said sections are closed one upon the other as is shown in Figures 1, 5 and 6.

Likewise, as is best seen in Figures 3 and 4, either the lugs or the recesses may engage matching recesses or lugs respectively of a secondary prismic section of a similar toy building block to form a combined block shape similar to that of original block 10. Thus, by variously interengaging the secondary prismic sections of the blocks, new block arrangements may be created. The combined hexhedrons of Figure 4 is an example but interlocking chains and other structures are also easily produced.

Figure 6 shows a block of the preferred embodiment having a corner broken away to show the engagement of lugs 21 and 24 with recesses 25 and 28 respectively. Figure 7 shows an enlarged view of the engagement of a lug (for example 24) from a secondary prismic section of a similar block with recess 25. The locking feature having at least two lugs engaging at least two recesses to form a major base 34 or 35 forms a secure attachment which will not easily wobble after the lugs are snapped into the recesses.

It should also be apparent from the various Figures that the major bases 34 and 35 and corresponding secondary bases 13, 14, 15 and 16 included exteriorly exposed ribs 40 between which are located land areas 41 (Figure 8). The ribs 40 are ideally disposed on a bias with respect to the surface configuration and are of varying heights (each decreasing from that which is thickest—the centre-most rib). This will accommodate for any material shrinkage in the event that the blocks are moulded from plastics materials, and will thus ensure the creation of substantially flat surface areas which are critical for good stacking characteristics. Similarly, rib width is substantially more than land width so that nesting is prevented. This also is dictated to produce satisfactory stacking features.

Another significant feature of the invention is the unobtrusive hinge 33, which is no more than a fine of material connecting lateral edges 31*a* and 31*b* and in effect is lateral edge 31. Unexpectedly no excess of material is needed to produce the hinge and therefore each lateral edge is similar to each other such edge. This is also significant not only to the esthetics of the blocks, but also to the functional interrelationships therebetween.

The block may be manufactured of any suitable material and is preferably manufactured from a resilient, shape-retaining, plastics material to assist in forming a securing means for holding one secondary prismic section to another which securing means can be easily engaged and disengaged.

In carrying into effect this invention, any prismic toy building block may be used which is defined by at least one base and a plurality of connecting sidewalls and is sectioned a long a plane passing through at least two opposing sidewalls. Two secondary prismic sections will be formed by the sectioning plane and these sections are hinged together along one of the lines defined by the intersection of the sectioning plane with the base or one of the side walls so that the toy building block may be opened by pivoting the secondary sections relative to one another about the noted hinge. The block may likewise be similarly sectioned by more than one plane and the resulting sections may be attached to each other by more than one hinge.

In accordance with this invention, each of the secondary prismic sections is provided with a connecting means that selectively retains the secondary polyhedral sections in a closed position and which is adapted to interconnect with similar mating sections of like prismic toy building blocks when each have been opened.

While a toy building block having any prismic shape can be made having the majority of the advantages taught by this invention a hexahedral shape is preferred due to the regular stacking and connecting features which result.

The sectioning plane may pass through a line formed by the intersection of a pair of the side walls of the hexahedron or, in other words, a lateral edge, thus a parting line between the prismic secondary prismic sections is hidden by the lateral edge.

WHAT WE CLAIM IS:—

1. A prismic toy building block having at least one base and a plurality of connecting lateral side walls with lateral edges formed where said lateral side walls intersect, which building block is sectioned along a plane passing through at least two opposing lateral side walls to thereby form two secondary prismic sections each of which sections has a planar area formed by said plane, said secondary prismic sections being hinged together where said plane intersects one of said opposed lateral side walls so that said toy building block may be opened by separating said secondary prismic sections along said sectioning plane by pivoting one of said secondary prismic sections about said hinge with respect to the other of said

secondary prismic sections, means being provided for releasably securing each of said secondary prismic sections along said planar area to a secondary section of a similar toy building block along the planar area of one of its secondary prismic sections such that a chain of such blocks may be built up in which each of said blocks, other than the end blocks in the chain, is secured to two adjacent blocks, said securing means also being capable of releasably holding said secondary prismic sections of said block together along said planar areas when said sections are not separated.

2. A toy building block as claimed in claim 1, wherein said securing means comprises a plurality of lugs on one of said secondary prismic sections and recesses on the other of said secondary prismic sectoins for accepting said lugs so that said lugs will snap into said recesses to securely and releasably hold said secondary prismic sections together when said sections are not separated or, when said sections are separated, to securely and releasably hold either or both of said sections to a separated secondary prismic section of a similar top building block.

3. A toy building block as claimed in claim 1 or claim 2, wherein said plane which sections said building block passes through at least two opposed lateral edges, each of said edges being an edge of one of said at least two opposed lateral side walls.

4. A toy building block as claimed in claim 3, wherein said securing means comprises a plurality of lugs positioned both proximate said hinge and proximate the lateral edge opposing said hinge on one of said secondary prismic sections, and matching recesses for accepting said lugs on the other of said secondary prismic sections.

5. A toy building block as claimed in any one of the preceding claims, which block is hollow.

6. A toy building block as claimed in claim 5, wherein said planar areas are open areas so that access to the hollow portion of each of said secondary prismic sections may be achieved through said planar areas.

7. A toy building block as claimed in any of the preceding claims, wherein said block is manufactured of a resilient shape-retaining plastics material.

8. A toy building block as claimed in any one of the preceding claims, which block is cubic.

9. A toy building block as claimed in claim 8, wherein said secondary prismic sections are equal right triangular prisms.

10. A toy building block as claimed in any one of the preceding claims, wherein there are two bases on each block.

11. A toy building block as claimed in any one of the preceding claims, wherein the or each base has exteriorly exposed ribs thereon.

12. A toy building block as claimed in claim 1 and substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

13. A set of toy building blocks as claimed in any one of the preceding claims, wherein the secondary prismic sections of each of said blocks have been separated and said blocks are interconnected by said securing means.

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